

tions of another animal, the *Limnoria terebrans*, of Leach, belonging to the class of Crustacea, whose depredations on timber are no less extensive and formidable than the *Teredo*. At Portpatrick it appears that both these animals have combined their forces in the work of destruction, the *Teredo* consuming the interior, and the *Limnoria* the superficial parts of the wood; the latter continuing its labours until it comes in contact with the shells of the former, so that the whole mass is speedily deprived of cohesion. It is stated, on the authorities of Mr. Hyndman and Mr. Stephen, that the *Limnoria* is already committing great ravages in the timber at Donaghadee.

2. "On the Nervous System of the *Sphinx ligustri* (Linn.) during the latter Stages of its Pupa and its Imago States; and on the Means by which its Development is effected." By George Newport, Esq. Communicated by P. M. Roget, M.D., Sec. R.S.

In a paper formerly read to the Royal Society, and printed in the Philosophical Transactions, the author has given a description of the anatomy of the nervous system of the *Sphinx ligustri* in its larva, and the earlier periods of its pupa, state; and he has since prosecuted the inquiry then commenced, following the changes of structure through the remaining stages, until the insect has arrived at its full development. He enters into minute details of all these changes, which vary considerably in the rapidity with which they take place at different periods, according as the vital powers are called into action by external circumstances, or become exhausted by their efforts at effecting the growth or modifying the form of different parts. Thus the ganglia and nervous cords undergo great changes both in their form and situation, and also in their number, during the passage of the insect from the larva to the pupa state; and after these changes have been carried to a certain extent, they are suspended for several weeks, during which the insect remains in a state of hybernation; but at the expiration of this period the changes again proceed, and are continued uninterruptedly, till the insect attains its ultimate or perfect stage of development. The *Sphinx ligustri* remains in the pupa state during at least forty-two or forty-three weeks; thus affording ample opportunities of examining the whole progress of the changes which take place in the structure of different parts. The concentration of the nervous system, which was commenced in the larva, proceeds to a much greater extent while the insect is inclosed in the pupa, and is continued for a short time after it has assumed the imago state. The double origin and connexions of the nerves distributed to the wings are described, and a conjecture offered as to the object of this arrangement, which appears designed to establish a harmony of action between the wings, in those insects, especially, which are remarkable for velocity and power of flight; a different disposition being adopted in those which fly with less regularity or speed. The nerves of the organs of sense, as the antennæ, eyes, proboscis, and apparatus for manducation, are traced and minutely described, and a comparison instituted between them and the nerves which have similar offices in vertebrated animals. The author traces the origin and course of the

nerve corresponding to the *pneumo-gastric*, or *par vagum*, and shows that it is distributed chiefly to the organs of digestion and the respiratory passages. He next describes the anterior lateral cephalic ganglia, which, from their position, might be regarded as auxiliary brains. The situation and course of another nervous tract, which from its extensive connexions and peculiar mode of distribution is considered as corresponding to the sympathetic system, are also traced. The author notices a set of nerves which, adopting the views of Sir Charles Bell, he considers as analogous to those which the latter has denominated the respiratory nerves of vertebrated animals ; and among a great number of interesting observations, of which it is impossible to give any abridged account, one of the most remarkable is the discovery that the primary longitudinal nervous cords of insects consist of two tracts, the one situated over the other, corresponding to the two columns of which the spinal cord consists in vertebrated animals ; the one appropriated to sensation, and the other to voluntary motion ; the nerves from each of these tracts being variously combined, according to the purposes they are designed to fulfil. This important distinction, which was first traced in the nervous cords of the Lobster, was afterwards distinctly observed by him in the *Scorpion* and the *Scolopendra*, and lastly, in several species of insects, as the *Gryllus viridissimus*, the *Carabus*, the *Papilio urticae*, and the *Sphinx ligustri*. Numerous drawings of the parts described accompany the paper.

3. "Observations on the Torpedo, with an account of some additional experiments on its Electricity." By John Davy, M.D., F.R.S., Assistant Inspector of Army Hospitals.

The first part of this paper is occupied by an investigation of the circumstances attending the foetal development of the Torpedo. In the first stage of embryonic growth which the author had an opportunity of observing, when the embryo was about seven tenths of an inch in length, it had neither fins nor electrical organs, nor any appearance of eyes ; it exhibited short external branchial filaments, not yet carrying red blood ; and there was a red spot in the situation of the heart, communicating by red vessels in the umbilical cord with the vascular part of the egg. There is no membrane investing the foetus, as is the case with some species of *Squali* ; nor any fluid in the uterine cavity ; neither could the author find any urea or lithic acid in that cavity. By taking the mean of many observations, it appeared that the weight of the egg, before any appearance of the embryo, is 182 grs., and after its appearance, including the weight of the latter, 177 grs. ; while the weight of the mature fish is about 479 grs. ; showing an augmentation of more than double. Thus it differs remarkably, in this respect, from the foetal chick, which at its full time weighs considerably less than the original yolk and white from which it is formed. No communication can be traced between the foetus of the Torpedo and the parent, through the medium of any vascular or cellular structure ; and the stomach of the former is always found empty. Hence the only apparent source of nourishment is absorption from the surface ;